Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; and

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information, wherein each of said locations in said multiplanar frame buffer ~~is~~ stores image data associated with a corresponding pixel to be displayed on one of said plurality of display surfaces ~~elements~~.

Claim 2 (currently amended): The method of claim 1 wherein the storing comprises:

reading the z-coordinate information;

scaling the z-coordinate information within a range corresponding to one or more display ~~elements~~ surfaces in the three-dimensional volumetric display upon which the three-dimensional image is to be displayed; and

assigning memory locations in the multiplanar frame buffer for the three-dimensional image data based on the scaled z-coordinate information.

Claim 3 (canceled)

Claim 4 (currently amended): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations of the multiplanar frame buffer corresponding to a two-dimensional slice of the three-dimensional image to be displayed as a plurality of pixels on one or more display ~~elements~~ surfaces of the three-dimensional volumetric display.

Claim 5 (previously presented): The method of claim 1 wherein the three-dimensional volumetric display has addressable (x,y,z) coordinates.

Claim 6 (previously presented): The method of claim 5 wherein the storing further comprises assigning memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr = N_{b/p} * (x + N_x * y + N_x * N_Y * z_i)$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional

volumetric display, N_Y is the number of pixels in the y dimension of the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 7 (previously presented): The method of claim 1 wherein the three-dimensional volumetric display has addressable (r, y' and theta) coordinates.

Claim 8 (previously presented): The method of claim 7 wherein the storing further comprises assigning memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{B/P}*(r*cosine\ (theta)+N_r*y' +N_r*N_{y'}*r*sine\ (theta))$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 9 (previously presented): The method of claim 1 wherein the storing comprises:

providing a first memory;

storing the three dimensional image data in the first memory; and

transferring the three dimensional image data stored in the first memory to the multiplanar frame buffer.

Claims 10-11 (canceled)

Claim 12 (previously presented): The method of claim 1 further comprising transferring the three-dimensional image data to the three-dimensional volumetric display in accordance with the z-coordinate information.

Claim 13 (previously presented): The method of claim 1 wherein the three-dimensional image data further comprises transparency information and brightness information.

Claims 14-15 (canceled)

Claim 16 (previously presented): The method of claim 12 further comprising displaying an image on the three dimensional volumetric display.

Claim 17 (currently amended): The method of claim 16 wherein the plurality of display ~~elements~~ surfaces of the three dimensional volumetric display comprises multiple planes upon which the image is displayed.

Claim 18 (currently amended): The method of claim 16 wherein the three dimensional volumetric display comprises a plurality of self-luminescent optical surfaces ~~elements~~.

Claim 19 (original): The method of claim 16 wherein the three dimensional volumetric display is a swept-volume display.

Claim 20 (previously presented): The method of claim 1 wherein the generating comprises generating the three-dimensional image data with a personal computer.

Claim 21 (previously presented): The method of claim 1 wherein the generating comprises converting the three-dimensional image data into data corresponding to a plurality of two-dimensional cross-sectional images forming the three-dimensional image.

Claim 22 (previously presented): The method of claim 1 wherein the generating comprises generating the three-dimensional image data by an application programming interface.

Claim 23 (previously presented): The method of claim 1 wherein the generating comprises generating the three-dimensional image data from a plurality of geometric primitives.

Claims 24-46 (canceled)

Claim 47 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information and for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and

a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~ on which said stored three dimensional image data is displayed as a plurality of pixels at corresponding locations on said plurality of display surfaces ~~elements~~.

Claim 48 (currently amended): The three dimensional image display system of claim 47 wherein the graphics data processor:

reads the z-coordinate information;

scales the z-coordinate information within a range corresponding to one or more display ~~elements in~~ surfaces of the three-dimensional volumetric display upon which the three dimensional image is to be displayed; and

assigns memory locations in the multiplanar frame buffer for the three-dimensional image data based on the scaled z-coordinate information.

Claim 49 (canceled)

Claim 50 (currently amended): The three dimensional image display system of claim 47 wherein the graphics data processor stores the three dimensional image data having substantially identical z-coordinate information in memory locations of the multiplanar frame buffer that correspond to a two-dimensional slice of the three-dimensional image to be displayed on one or more display ~~elements~~ surfaces of the three-dimensional volumetric display.

Claim 51 (previously presented): The three dimensional image display system of claim 47 wherein the three-dimensional volumetric display has addressable (x,y,z) coordinates.

Claim 52 (previously presented): The three dimensional image display system of claim 51 wherein the graphics data processor is further designed to assign a memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*\ N_y*z_i)$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional volumetric display, N_y is the number of pixels in the y dimension of the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 53 (previously presented): The three dimensional image display system of claim 47 wherein the three-dimensional volumetric display has addressable (r, y' and theta) coordinates.

Claim 54 (previously presented): The three dimensional image display system of claim 53 wherein the graphics data processor is further designed to assign a memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{B/P}*(r*cosine\ (theta)+N_r*y'\ N_r*N_{y'}*r*sine\ (theta))$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for a pixel having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 55 (previously presented): The three dimensional image display system of claim 47 further including a first memory, wherein the graphics data processor is further designed to

store the three dimensional image data in the first memory; and

transfer the three dimensional image data stored in the first memory to the multiplanar frame buffer.

Claims 56-57 (canceled)

Claim 58 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to transfer the three-dimensional image data to the three-dimensional volumetric display in accordance with the z-coordinate information.

Claim 59 (previously presented): The three dimensional image display system of claim 47 wherein the three dimensional image data further comprises transparency information and brightness information.

Claims 60-61 (canceled)

Claim 62 (previously presented): The three dimensional image display system of claim 58 wherein the graphics data processor is further designed to display an image on the three dimensional volumetric display.

Claim 63 (currently amended): The three dimensional image display system of claim 62 wherein the plurality of display ~~elements~~ surfaces of the three dimensional volumetric display comprises multiple planes upon which the image is displayed.

Claim 64 (currently amended): The three dimensional image display system of claim 62 wherein the three dimensional volumetric display comprises a plurality of self-luminescent optical ~~elements~~ surfaces.

Claim 65 (previously presented): The three dimensional image display system of claim 62 wherein the three dimensional volumetric display is a swept-volume display.

Claim 66 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to generate the three-dimensional image data with a personal computer.

Claim 67 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to convert the three-

dimensional image data into data corresponding to a plurality of two-dimensional cross-sectional images that form the three-dimensional image.

Claim 68 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to generate the three-dimensional image data by an application programming interface calls.

Claim 69 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to generate the three dimensional image data from a plurality of geometric primitives

Claim 70 (previously presented): The method of claim 13 further comprising the step of discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 71 (previously presented): The method of claim 13 further comprising the step of modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the

second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 72 (previously presented): The method of claim 13 further comprising the step of modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 73 (previously presented): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to discard the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 74 (previously presented): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to modulate the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 75 (previously presented): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to modulate the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 76 (previously presented): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations within one common physical partition of the multiplanar frame buffer.

Claim 77 (previously presented): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations within one common logical partition of the multiplanar frame buffer.

Claim 78 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to store image data having substantially identical z-coordinate information in memory locations within one common physical partition of the multiplanar frame buffer.

Claim 79 (previously presented): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to store image data having substantially identical z-coordinate information in memory locations within one common logical partition of the multiplanar frame buffer.

Claim 80 (previously presented): The method of Claim 1, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 81 (previously presented): The three dimensional image display system of Claim 47, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 82 (previously presented): The method of Claim 9, wherein the first memory comprises a multiplanar frame buffer.

Claim 83 (previously presented): The three dimensional image display system of Claim 55, wherein the first memory comprises a multiplanar frame buffer.

Claim 84 (previously presented): The method of Claim 1, wherein the storing comprises:

processing the three dimensional image data;

assigning memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the (x,y,z) coordinate information; and

transferring the processed three dimensional image data to the assigned memory locations in the multiplanar frame buffer.

Claim 85 (previously presented): The method of Claim 84, wherein the processing comprises performing depth testing.

Claim 86 (previously presented): The method of Claim 84, wherein the processing comprises performing multiplanar antialiasing.

Claim 87 (previously presented): The method of Claim 84, wherein the processing comprises performing alpha blending.

Claim 88 (previously presented): The three dimensional image display system of Claim 47, wherein the graphics data processor is further designed to:

process the three dimensional image data;

assign memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the (x,y,z) coordinate information; and

transfer the processed three dimensional image data to the assigned memory locations in the multiplanar frame buffer.

Claim 89 (previously presented): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform depth testing.

Claim 90 (previously presented): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform multiplanar antialiasing.

Claim 91 (previously presented): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform alpha blending.

Claim 92 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~ and addressable (x,y,z) coordinates, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; and

assigning memory locations in a multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*N_Y*z_i)$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional volumetric display, N_y is the number of pixels in the y dimension of the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 93 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~ and addressable (r, y' and theta) coordinates, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; and

assigning memory locations in a multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr = N_{B/P} * (r * cosine\ (theta) + N_r * y' + N_r * N_{y'} * r * sine\ (theta))$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 94 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information, and for assigning memory locations in said multiplanar frame buffer for said three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*\ N_y*z_i)$$

wherein Addr is said assigned memory location in said multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of said three-dimensional volumetric display, N_y is the number of pixels in the y dimension of said three-dimensional volumetric display, and z_i is an integer portion of the scaled z-coordinate value, and

a three-dimensional volumetric display having addressable (x,y,z) coordinates and a plurality of display ~~elements~~ surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 95 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information, and for assigning memory locations in said multiplanar frame buffer for said three dimensional image data in accordance with the equation:

$$Addr = N_{B/P} * (r * cosine\ (theta) + N_r * y' \ N_r * N_{y'} * r * sine\ (theta))$$

wherein Addr is said assigned memory location in said multiplanar frame buffer for a pixel having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of said three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of said three-dimensional volumetric display, and

a three-dimensional volumetric display having addressable (r, y' and theta) coordinates and a plurality of display surfaces ~~elements~~ on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 96 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; and

discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 97 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; and

modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 98 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; and

modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 99 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for discarding the three dimensional image data associated with a second pixel if the transparency

information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~ on which image data stored in said mutiplanar frame buffer may be displayed as a plurality of pixels.

Claim 100 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display surfaces ~~elements~~ on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 101 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display ~~elements~~ surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.